

## MUHLENBERGIA UNIFLORA.

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MUHLENBERGIA **uniflora** (Muhl.), n. comb. *Poa*? *uniflora* Muhl. Descr. Gram. 151 (1817). *Agrostis serotina* Torr. Fl. U. S. i. 88 (1824). *Vilfa serotina* Torr. in Gray, Gram. et Cyp. i. no. 2 (1834). *V. tenera* Trin. Mém. Acad. St. Pétersb. Sér. 6, vi. 87 (1840). *Poa modesta* Tuckerm. Am. Journ. Sci. xlv. 45 (1843). *Sporobolus serotinus* (Torr.) Gray, Man. 577 (1848). *S. uniflorus* (Muhl.) Scribn. & Merr. U. S. Div. Agrost. Circ. 27: 5 (1900).

*Muhlenbergia uniflora* is the delicate grass of northeastern America which long passed as *Sporobolus serotinus* and which has recently been called *S. uniflorus*. It is a most definite *species* but, as indicated above and as will appear in the discussion, its generic and even its tribal affinity have both been open to varying interpretations, the species passing at different times as a member of *Poa* and of *Eragrostis* of the *Festuceae* and at other times as a species either of *Agrostis*, *Vilfa* or *Sporobolus* of the *Agrostideae*; and now, rightly as it seems to me, it finds a place in *Muhlenbergia* of the latter tribe. *Sporobolus*, as the generic name clearly indicates, is the genus of the *Agrostideae* with grains free at maturity, as in *Eragrostis* of the *Festuceae*. Not only are its grains free (whence the English "Drop-seed Grass") but the lemmas or flowering glumes are delicately membranaceous and often colorless. The plant which has been passing as *Sporobolus uniflorus* is emphatically not a "Drop-seed Grass;" its mature grains, gathered in October when the spikelets are quite ripe, are firmly embraced by the lemma and palea and much mechanical force is required to free them; in other words, the fruit is that of *Muhlenbergia*. Furthermore, the firm green to metallic-purple 3-5-nerved lemmas remove the species from *Sporobolus* and place it in *Muhlenbergia*.

On the American continent *Muhlenbergia uniflora* has a diffuse panicle but in the Newfoundland variety, later to be discussed, the panicles are usually contracted and slender, closely simulating those of *M. Richardsonis* (Trin.) Rydb. and its allies which Rydberg<sup>1</sup> has rightly removed from *Sporobolus*. In fact, the habit of *M. uniflora*, of becoming perennial by proliferation from the lower axils of the old culms, is so like that of *M. Richardsonis* (*Sporobolus Richardsonis* Merr.), that the extreme plant of Newfoundland is quickly separated from *M. Richardsonis* only by its smaller spikelets and blunter lemmas.

<sup>1</sup> Rydberg, Bull. Torr. Bot. Cl., xxiii, 599-601 (1905).

When well developed, *Muhlenbergia uniflora* has diffuse panicles with freely forking capillary branches and with the capillary pedicels mostly 2–6 times as long as the spikelets. In Newfoundland, however, as already noted, it tends to have a strongly contracted panicle, with erect only slightly forking branches; but occasional colonies with spreading branches are found. The extreme Newfoundland plants have panicles only 0.2–1 cm. in diameter, but the exceptionally large panicles reach a diameter of 3 cm. In all Newfoundland specimens (and a few from Nova Scotia) the pedicels are short, many of them less than twice the length of the spikelets. But the most interesting point shown by many of the Newfoundland plants is the tendency of the terminal spikelets to be 2-flowered, with the lower flower perfect, the upper pistillate. Not all the plants exhibit this character but of 11 numbers before me 6 show some of the terminal spikelets 2-flowered, some panicles with only 1 or 2 such spikelets, others with varying numbers up to 35. Departing in three tendencies from the continental type and clearly connecting with it in Nova Scotia, the Newfoundland plant is most satisfactorily treated as a geographic variety, the two extremes very distinct but not fully differentiated from each other since the segregation of the Newfoundland and the continental areas by the submergence of the continental shelf. It is proposed as

*MUHLENBERGIA UNIFLORA*, var. **terrae-novae**, n. var., a forma typica recedit paniculis plerumque contractis 1.2–8 cm. longis 0.2–1 cm. diametro (rare diffusis deinde 3 cm. diametro), ramulis plerumque coarctatis; pedicellis lateralibus plerumque 1–2 mm. longis; spiculis superioribus saepe bifloris, flore superiore femineo.—NEWFOUNDLAND. The following are thoroughly characteristic: moss and silicious rocks along rill, slope of South Hill, St. John's, August 14, 1924, *Fernald, Long & Dunbar*, no. 26,244 (TYPE in Gray Herb.); wet mossy and turfy slopes of sandstone and arenaceous slate hills back of Carbonear, August 6 and 7, 1911, *Fernald & Wiegand*, no. 4539; peaty or muddy borders of ponds, Grand Falls, August 14, 1911, *Fernald, Wiegand & Darlington*, no. 4540; wet sandy shore of Rushy Pond, August 28, 1911, *Fernald, Wiegand & Darlington*, no. 4541; open peat bogs back of Birchy Cove (Curling), August 10, 1910, *Fernald, Wiegand & Kirtledge*, no. 2504; seepy runs in bog-barrens among the gneiss hills back of Port aux Basques, August 31, 1924, *Fernald, Long & Dunbar*, no. 26,243. The following display no 2-flowered spikelets but are otherwise characteristic: swamps near confluence of Exploits River and Badger Brook, August 13, 1894, *Robinson & Schrenk*; bogs, Bishop Falls, July 28 and 29, 1911, *Fernald, Wiegand & Darlington*, no. 4538; boggy shores of small ponds, Birchy Cove (Curling),

August 11, 1910, *Fernald, Wiegand & Kittredge*, no. 2503; depressions in sphagnous marsh, Lark Harbor, August 31, 1926, *Fernald, Long & Fogg*, no. 100; bare depressions in wet peat on gneiss hills along Grandy Brook, September 11, 1926, *Fernald, Long & Fogg*, no. 101.

The occurrence of 2-flowered spikelets is not restricted to the Newfoundland plant, though it is there more general than on the continent. Throughout the range of typical *Muhlenbergia uniflora* plants with 2-flowered spikelets occur. Thus, the typical continental plant is represented in the Gray Herbarium and the herbarium of the New England Botanical Club by 160 numbers; and of these, 27 numbers (17% of the whole) show 2-flowered spikelets: plants from Nova Scotia, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey and Michigan. In most specimens such spikelets are few (1 to 3 or 4) but in some collections they are so abundant as to give the plant a resemblance to *Eragrostis capillaris* (L.) Nees. *M. uniflora* was originally described by Muhlenberg as perhaps a *Poa*, *Poa? uniflora*, which he thought might be a variety of *Poa capillaris* L., now universally called *Eragrostis capillaris* ("Habitus *P. capillaris*, cujus forsan varietas"—Muhlenberg); and the late William Boott, certainly an acute botanist, collecting material with 2-flowered spikelets at Fresh Pond, Middlesex Co., Massachusetts, and Thoreau, getting a similar plant near Concord, each labeled it without question as *Eragrostis capillaris*! Furthermore, Edward Tuckerman, familiar with the Fresh Pond plant with 2-flowered spikelets, described it as *Poa modesta* "spiculis . . . bifloris," identifying with it Muhlenberg's *P. ? uniflora* but changing the seemingly inappropriate name because "it seems almost certain that it [Muhlenberg's plant] was a branch of this *Poa*, from which part of the florets had fallen off;" and John Carey, commenting, in the Gray Herbarium, on material called *Poa modesta* from New Hampshire, wrote: "I do not see why these may not be reduced northern forms of *Eragrostis capillaris*."<sup>1</sup>

It is, likewise, significant that, although the treatment given by Hitchcock in the 7th edition of Gray's *Manual* eliminates conspicuous

<sup>1</sup> In view of the obvious difficulty of quickly distinguishing young plants of *Muhlenbergia uniflora* with 2-flowered spikelets from small plants of *Eragrostis capillaris*, the following statement of contrasts may prove useful.

**ERAGROSTIS CAPILLARIS.** Tufted annual, with ciliate leaf-sheaths; spikelets 2-several-flowered; glumes attenuate; upper lemma (when spikelet only 2-flowered) distinctly overtopping the lower; *mature grain free* from the lemma and palea.

**MUHLENBERGIA UNIFLORA.** Perennial by proliferation from the lower axils of old culms; leaf-sheaths glabrous; spikelets 1-2-flowered; glumes blunt or merely acutish; upper lemma (when spikelets 2-flowered) barely exceeding the lower; *mature grain closely embraced* by the lemma and palea.

mention of 2-flowered spikelets in *Sporobolus* and *Muhlenbergia* (merely giving a note under *S. compressus*, "Spikelets rarely 2-flowered"), all six preceding editions, beginning with Gray's own in 1848 and running through the Watson & Coulter edition of 1889, consistently defined the genus *Sporobolus* with "Spikelets 1- (rarely 2-) flowered" and placed *S. compressus* (*S. Torreyanus*) and *S. serotinus* (now *Muhlenbergia uniflora*) in a section with "*spikelets not unfrequently 2-flowered.*" Bentham & Hooker, also, in their synopsis of genera under the tribe *Agrostideae*, add "Excepta: Spiculae interdum 2-florae in speciebus 2 Sporoboli;"<sup>1</sup> and in their fuller discussion designated the two species emphasized by Gray. And Nash went still further, in his description of *Sporobolus* saying "occasionally 2-3-flowered."<sup>2</sup>

It should be sufficiently clear from these notes that *Muhlenbergia uniflora* is a species of unusual interest. Ordinarily it is a perfectly good *Muhlenbergia*, with 1-flowered spikelets, but occasionally it develops a few spikelets which are at variance with the general character of *Muhlenbergia* and the tribal character of the *Agrostideae* in having 2 flowers; and when these spikelets become numerous, as in the plant which Tuckerman described as *Poa modesta* and which Carey, William Boott and Thoreau independently identified with *Eragrostis capillaris*, the line between the tribes *Festuceae* and *Agrostideae* indeed becomes obscure. Not only do *Muhlenbergia uniflora* and *Sporobolus compressus*<sup>3</sup> show this breakdown of a traditional tribal character, but it is easy to find in some other species—*S. confusus* Vasey and *S. asperifolius* (Nees & Meyen) Thurb., for example—a few 2-flowered spikelets; and as early as 1843 Torrey described his *Muhlenbergia ambigua* as "1-2-flowered . . . superior floret often perfect, and maturing its fruit;"<sup>4</sup> while Scribner states that "The presence of a more or less developed second floret, noted in the original diagnosis of *M. ambigua*, occurs in other species of this group"<sup>5</sup> The development of occasional 2-flowered spikelets in *Agrostis* (for instance, *A. borealis* Hartm. from Newfoundland, *Wiegand, Gilbert & Hotchkiss*, no. 26,476) further indicates that search may show such spikelets to occur ex-

<sup>1</sup> Benth. & Hook. Gen. Pl., iii, 1084 (1880).

<sup>2</sup> Nash in Britton & Britton, Ill. Fl., i. 150 (1896).

<sup>3</sup> I have seen no good fruit of this species and am, therefore, not prepared to say whether it is a true *Sporobolus*.

<sup>4</sup> Torr. in Nicollet's Rep. 164 [237] (1843).

<sup>5</sup> Scribner, RHODORA, ix. 20 (1907).

ceptionally in other genera of the *Agrostideae*. Their exceptional occurrence is presumably a reversionary tendency in which the comparatively advanced *Agrostideae* hark back to the more primitive *Festuceae*; at least, such an interpretation is in accord with the views of the relative advancement of the two tribes put forward in 1911 by the late C. E. Bessey<sup>1</sup> in an outline which has been adopted with only slight modification by Hitchcock<sup>2</sup> in this country and by Wettstein<sup>3</sup> in Europe.

GRAY HERBARIUM.

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## NOTES ON THE FLORA OF BOOTHBAY, MAINE—II.

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*MONTIA LAMPROSPERMA* Cham. This species was found on a salt-marsh at Ocean Point, confined to a spot where a brush pile had been burned the previous year. Hitherto unknown southwest of Penobscot Bay.

*EUPHRASIA PURPUREA* Reeks, var. *RANDII* (Robinson) Fernald & Wiegand. Very abundant at the edge of the turf on the summit of sea-cliffs, White Island. An extension of range southwestward.

*PLANTAGO JUNCOIDES* Lam., var. *GLAUCA* (Hornem.) Fernald. Exposed sea-cliffs, White Island.

*PLANTAGO OLIGANTHOS* R. & S., var. *FALLAX* Fernald. Salt marsh, Ocean Point. An extension southwestward from the station at Great Cranberry Island.<sup>4</sup> A study in the field of our two maritime species of *Plantago* confirmed the statements of Professor Fernald regarding their ecology. On the rocks and sea-cliffs *P. juncoides* and its variety *glauca* were consistently found, while material collected on the salt-marshes was always *P. oliganthos* and its variety *fallax*.

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<sup>1</sup> "There are six tribes and several sub-tribes, of which the Bamboos are the lowest, while the *Agrostideae*, *Paniceae* and *Maydeae* are at the summits of as many diverging phyletic lines"—Bessey, *Outlines of Plant Phyla*, ed. 2: 14 (1911). Bessey's arrangement may have been published in the first edition, which I have not seen.

<sup>2</sup> "The tribes have been arranged in a new sequence based on the complexity of the flower structure."—Hitchcock, *Gen. Grasses U. S.* 2 (1920).

<sup>3</sup> Wettstein, *Handb. Syst. Bot. Aufl. 3*: 895-902 (1924).

<sup>4</sup> *RHODORA* xxvii. 93-104 (1925).